User Guide
Military Rugged Display Monitor

8.4” MILVM08L100-T1-4RT
10.4” MILVM10L100-P1-5RT
10.4” MLVM10L100-M3-5RT

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American Industrial Systems, Inc.

http://www.aispro.com

The test results show that this device meets FCC rules. Those limits are set to protect residential areas from harmful emissions from the devices. This device will produce, use and radiate radio frequency energy. In addition, failure to follow the user manual in order to install or use this device might produce harmful interference with radio communication. Foregoing this information does not guarantee that this type of harmful interference will not occur in some special instances. The interference caused by this device to radio or television signals may be verified by turning the device on and off. Any changes or modifications to this TFT LCD would void the user's authority to operate this device.

Important Recycle Instruction:

Lamp(s) inside this product contains mercury. This product may contain other electronic waste that can be hazardous if not disposed of properly. Recycle or dispose in accordance with local, state, or federal Laws. For more information, contact the Electronic Industries Alliance at WWW.EIAE.ORG. For lamp specific disposal information check WWW.LAMPRECYCLE.ORG

Table of Contents

1. Introduction 5

2. Important Safety Instructions 6

2.1 Electrostatic Discharge (ESD) 7

2.2 Grounding Methods 7

2.3 FCC Statement 7

2.4 Electromagnetic Capability 7

2.5 Important LCD Information 8

3. Packaging List 9

4. Product Description 10

4.1 General Information 10

4.2 Features 10

5. Mechanical Drawings 11

5.1 MILVM08L100-T1-4RT 11

5.1.1 MILVM08L100-T1-4RT Mechanical Drawings with Mounting Bracket 13

5.2 MILVM10L100-P1-5RT Mechanical Drawings 15

5.2.1 MILVM10L100-P1-5RT Mechanical Drawings with Mounting Bracket: 17

6. Touch Screen Solution 19

6.1 Introduction to Five-Wire Resistive Touch Screen 19

7. Installing the Military Grade Display 20

7.1 Military Grade $12V_{DC}$ 20

7.2 Signal Cable 20

7.2.1 VGA Signal Shielding Cable Connection 20

7.3 VESA Wall Mount Installation 21

8. LCD Display Operation 22

8.1 Navigating the OSD Menu 22

8.2 OSD Menu on VGA Mode 23

8.3 OSD Menu on DVI Mode 26

8.4 OSD Menu Summary 28

8.5 Simple Troubleshooting Guide 29

8.5.1 Brief FAQ 29
8.5.2 Additional Troubleshooting Chart: 30
9. Appendix 31
9.1 Cleaning the Monitor 31
9.2 Touch Screen Driver Installation 32
9.3 RMA (Return Material Authorization) Service 33

1.0 Introduction

This user manual is designed for American Industrial Systems, Inc. Military Rugged Display Monitor. Included is a comprehensive overview of the Military Rugged Display Monitor systems designed by American Industrial Systems.

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2.0 Important Safety Instructions

This chapter also includes information on approval and interference inhibition of your unit. Please abide by the warnings and instructions on the unit and in the manual. Please read these instructions carefully before using the product and save it for later reference.

- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Clean the product with a damp soft cloth. Do not use liquid or aerosol cleaners as it may cause permanent damage to the screen.
- Do not use this product near water.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. (For AC version only) Do not defeat the purpose of the grounding-type plug.
- Do not allow anything to rest on the power cord.
- Do not locate this product where persons will walk on the cord.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.
- Never spill liquid of any kind on the product.
- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks and will void the warranty. Refer all servicing to qualified service personnel.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power cord or plug is damaged or frayed. If liquid has been spilled into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    - If the product has been dropped or the cabinet has been damaged.
    - If the product exhibits a distinct change in performance, indicating a need for service.

The Military Rugged Display Monitor, Display system was built and tested by American Industrial Systems, Inc. in accordance to prescribed safety conditions, and in a safe condition.
In order to retain this condition and maintain safe operation, the users must abide by the instructions and warnings

- The electrical installations in the room must not violate the requirements of the local (country-specific) regulations.
- The unit must be used in accordance with these instructions.
- Pay close attention that there are no cables, especially power cables, in areas where ambulatory traffic may interfere.
- Only use the power cord supplied with the package. Don't use injured or damaged power cords.

2.1 Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can damage electrostatic-sensitive devices or circuit. Adequate packaging and grounding techniques are essential fundamentals to avoid damage. The following precautions should be always taken:

1. Deliver printed circuit boards in electrostatic-safe containers such as cartons, boxes or anti-static bags.
2. Keep electrostatic-sensitive parts in their containers until they reach an electrostatic-free station.
3. Follow adequate grounding when sensitive PCB's, components, or assemblies are in close vicinity of the unit.
4. Store electrostatic-sensitive PCB's in a protective packaging such as insulating foam.

2.2 Grounding Methods

Protect against electrostatic damage of the unit by taking the following preventative measures:

1. Cover workstations with approved anti-electrostatic material.
2. In order to guarantee that the operator is grounded, provide a wrist strap connected to the working bench.
3. Properly ground tools and equipment.
4. For extra protection use anti-electrostatic mats, heel straps, or air ionizers.
5. Handle electrostatic-sensitive components, PCB's, and assemblies with care nearby the case or the edge of the board.
6. Prevent contact with pins, leads, or circuitry.
7. Switch off power and input signals before plugging and removing connectors or testing equipment.
8. Keep the work area free from non-conductive materials such as ordinary plastic assembly aids and Styrofoam.
9. Use field service tools with conductivity, such as screwdrivers, pliers, and vacuum cleaners.
10. Always put drives, PCB's, and the like with the component-side down on the working bench.

2.3 FCC Statement

This equipment has been tested and found to comply with the requisites for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection from harmful interference when the equipment is operated in commercial environments. This equipment generates, uses, and radiates radio frequency energy, and if it is not installed and used in accordance with the instruction manual it may cause harmful interference to radiofrequency communications. Operation of this equipment in residential areas may cause harmful interference in which case the operator will be required to correct the interference at his or her own expense.

2.4 Electromagnetic Capability

The Military Rugged Display Monitor has been designed for industrial use. The most recent version of the EMC guidelines (EMC Directive 2004/108/EC) are applied. If the users modify and/or add to the equipment (e.g. installation of add-on cards), then the prerequisites for the CE conformity declaration (safety requirements) may no longer be applicable.

2.5 Important LCD Information

CAUTION		
Read manual prior to installing the product. The operation of products depends on you reading and following the information in this manual. Re-check your work prior to operating the product.		
EVENT	EFFECT	PREVENTION
	Sunlight shines directly will cause the panel damage.	You should avoid placing the product under direct sunlight.
	If the product is close to the wet ground such as grassplot, the moisture between panel and glass will make the product malfunction.	You should avoid placing the product in wet environment.

3.0 Packaging List

Item	Description	Note
	1 User Manual	
	1 CD for Touchscreen Drivers & Tools	
	1 Standard VGA Cable. **D-SUB 15pin Male to 15pin Male: 1.8m**	
	1 Power Cord	

4.0 Product Description

4.1 General Information

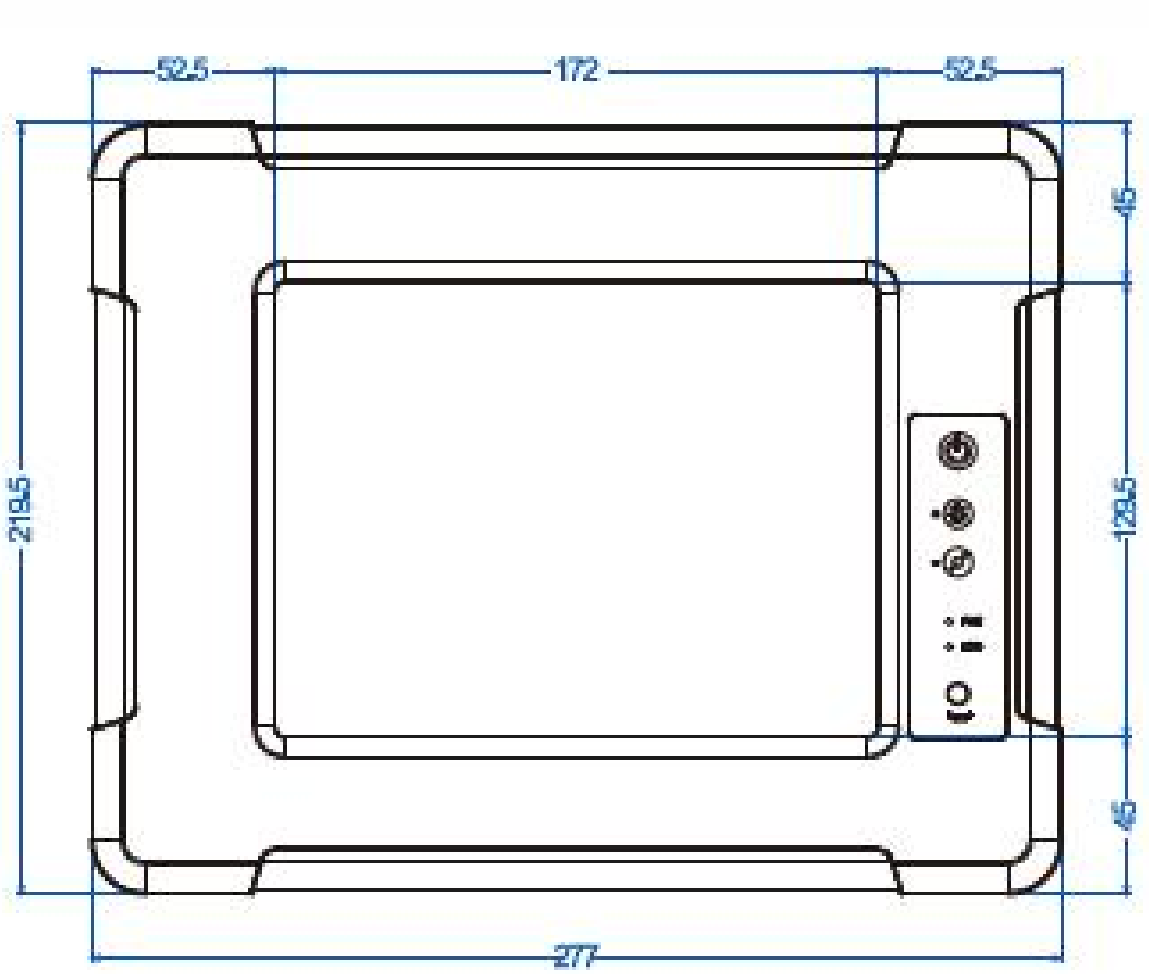
AIS offers a wide range of extremely rugged display monitors, including multi-function display (MFD) and military rugged displays with ruggedized touchscreen LCD interface, compliant with military (MIL-STD, MIL-SPEC, or MilSpecs) standards, specifically designed for the COTS military marketplace, and are used in rugged, wheeled and tracked military vehicles, as well as ground control stations. AIS military rugged displays have the following certification ratings: MIL-STD-810 standard for drops, shocks, vibration, humidity, altitude, rain, dust and sand-resistance, temperature extremes; and MIL-STD-461 standard for EMI and EMC, for size, weight, and power (SWaP); and ideal for constrained military, ground army, homeland defense, air traffic management (ATM) and air traffic control (ATC) applications. AIS custom rugged displays also offer excellent performance in terms of brightness, crispness, contrast and viewing angle. The bezel and mounting design can be customized to address virtually any type of mounting requirement in various applications. AIS ruggedized displays have been designed and qualified for deployment in the most hostile environments for specific ground army applications. AIS is certified ISO 9001:2008, maintains an International Traffic in Arms Regulations (ITAR) compliance program, and is registered with the US State Department Office of Defense Trade Controls Compliance (DTCC). AIS full-range selection of COTS military rugged LCD display monitors are offered in screen sizes 8.4", 10.4", 15", 17" 19" and 20.1".

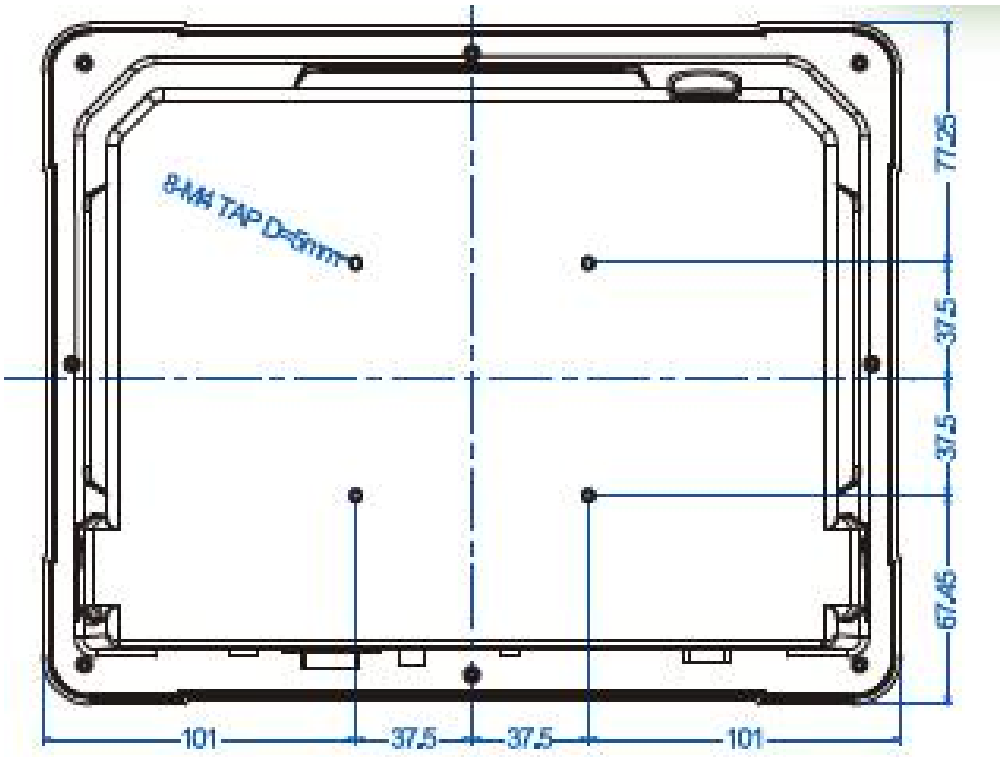
4.2 Features

- Tested to MIL-STD-810 standard methodology for a range of extreme conditions including drops, shocks, vibration, humidity, altitude, rain, dust and sand-resistance, temperature extremes and thermal shock.
- Multi-function display customization design service to meet customer-specific platform requirements and MIL-SPEC: MIL-STD-810G, MIL-STD-461F, MIL-STD-1275D, MIL-DTL-38999L, and MIL-STD-3009.
- Touchscreen/Anti-reflection Protection Glass
- IP65 OSD (On Screen Display) Front Panel Design
- Anti-shock and Vibration

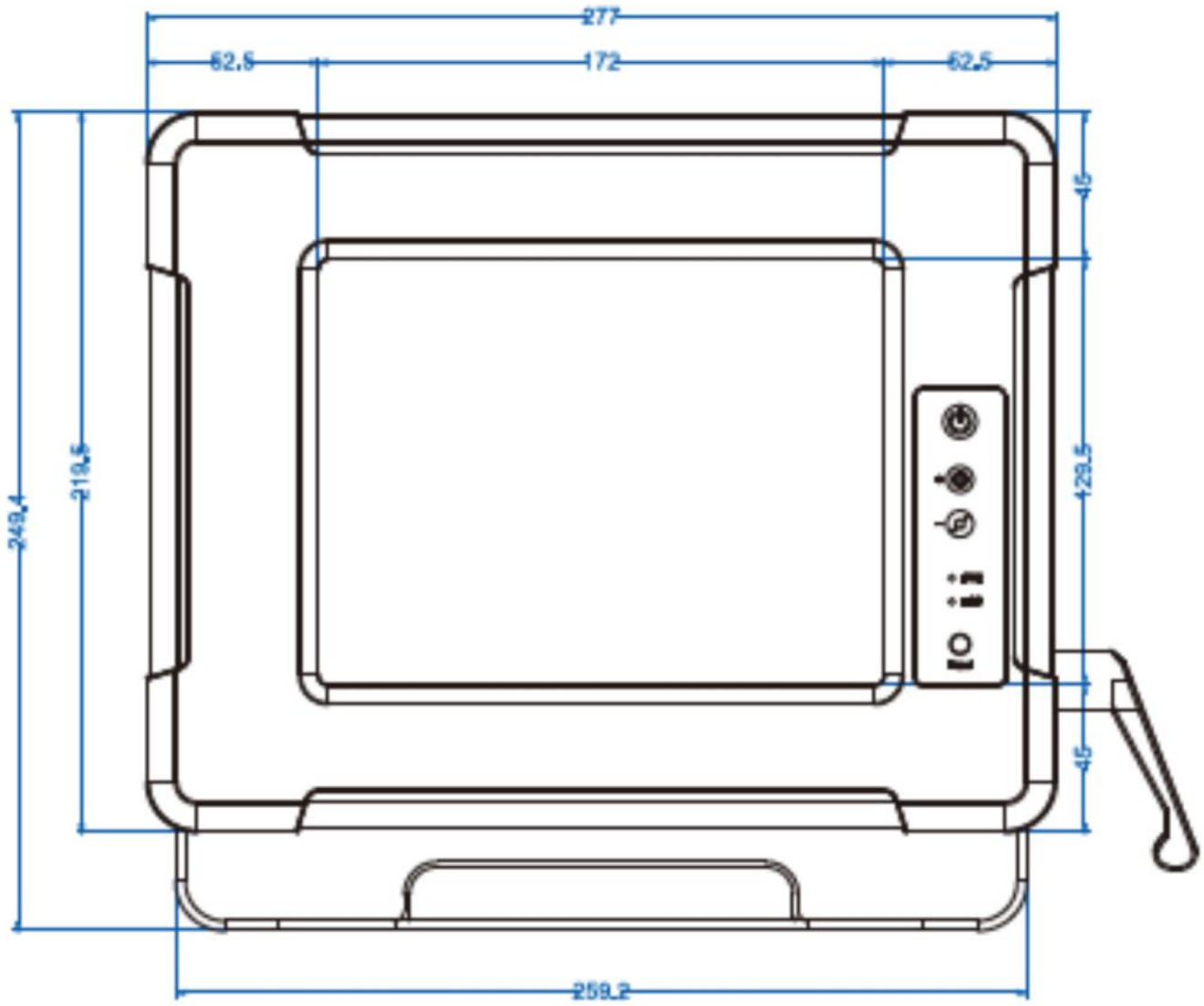
5.0 Mechanical Drawings

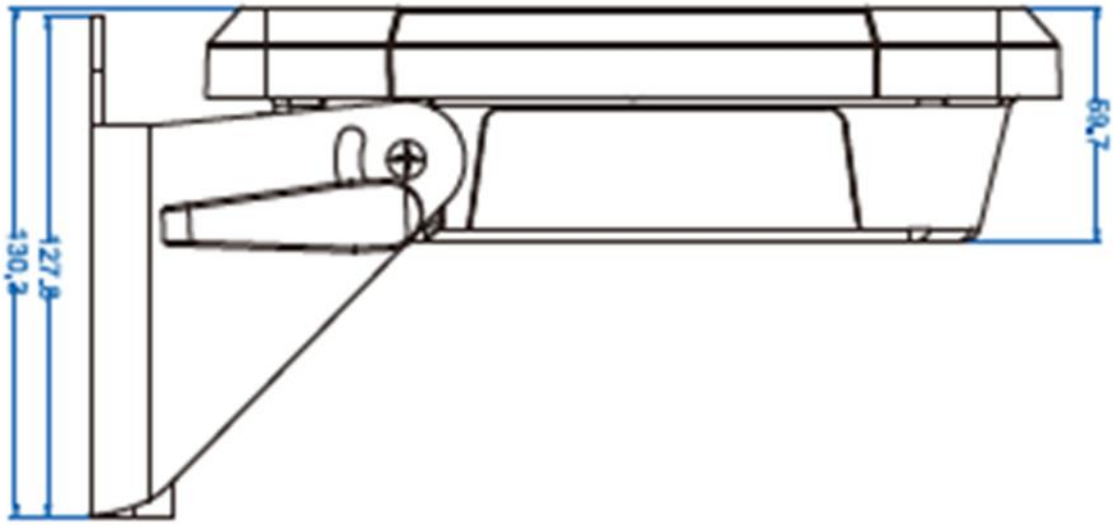
5.1 MILVM08L100-T1-4RT

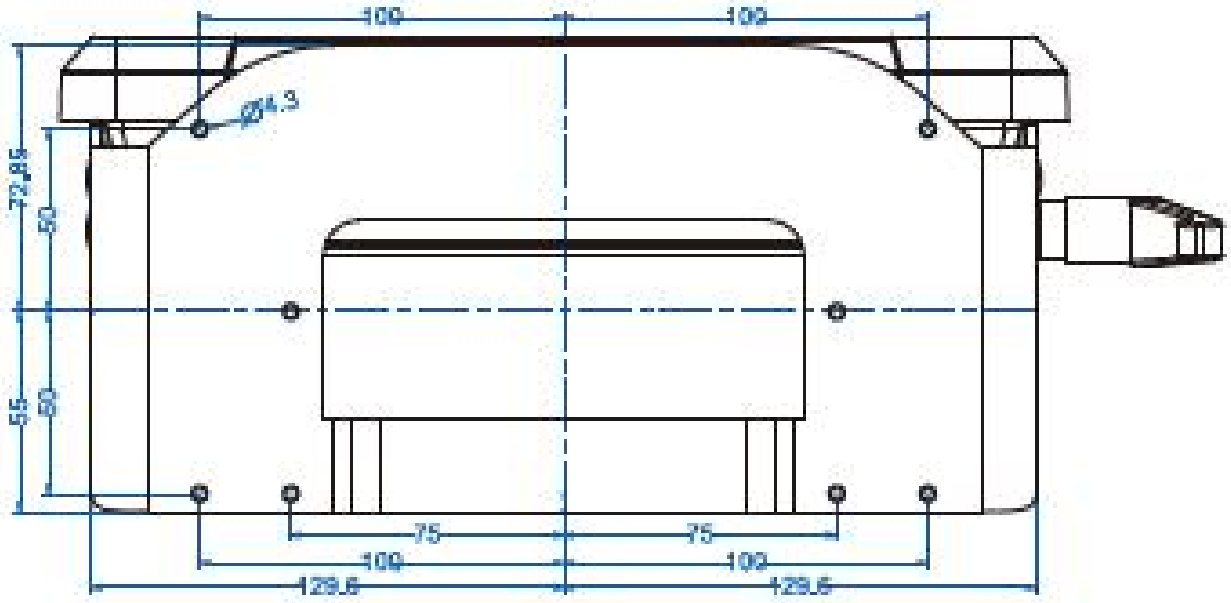



8-M4 TAP DEPTH
77.25
37.5
37.5
67.45
101
37.5
37.5
101

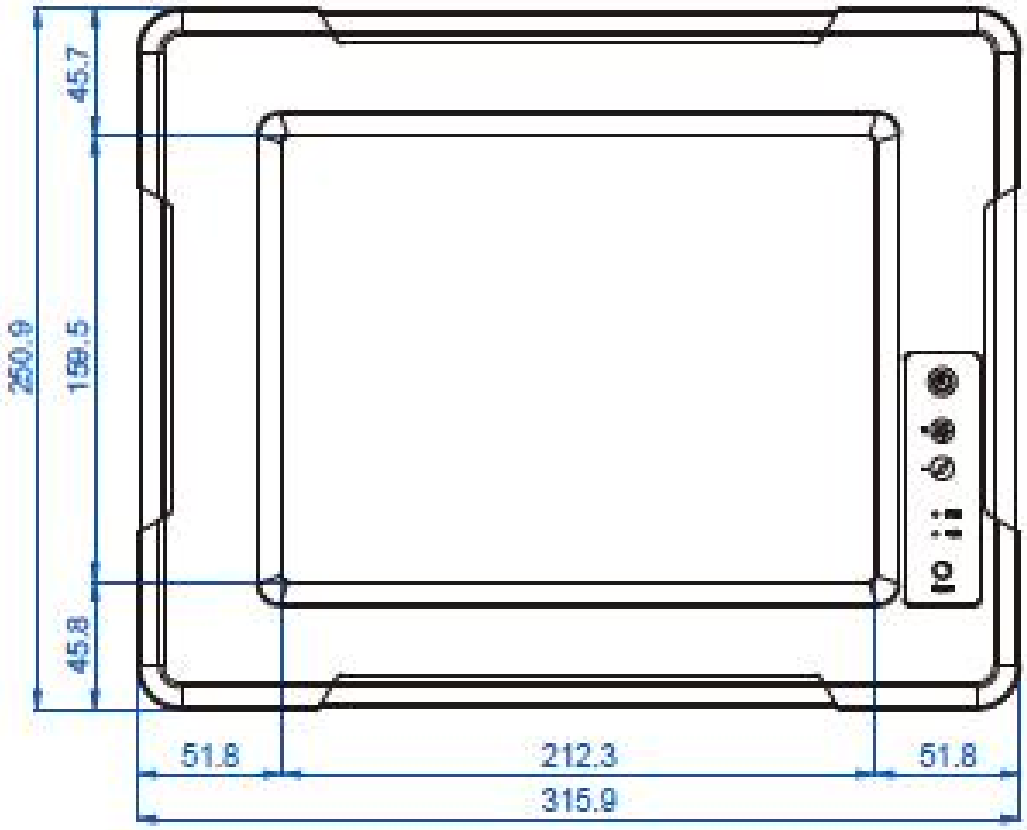
5.1.1 MILVM08L100-T1-4RT Mechanical Drawings with Mounting Bracket

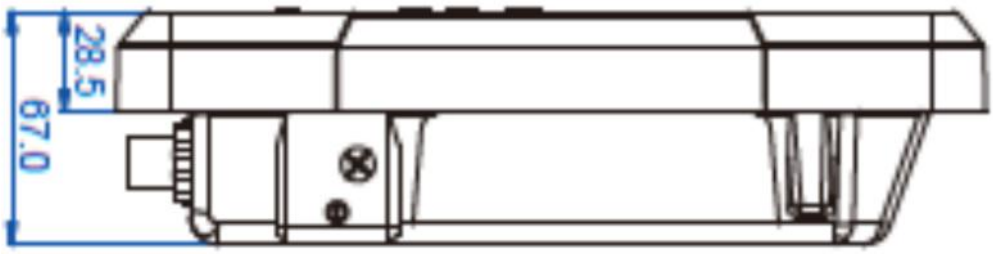


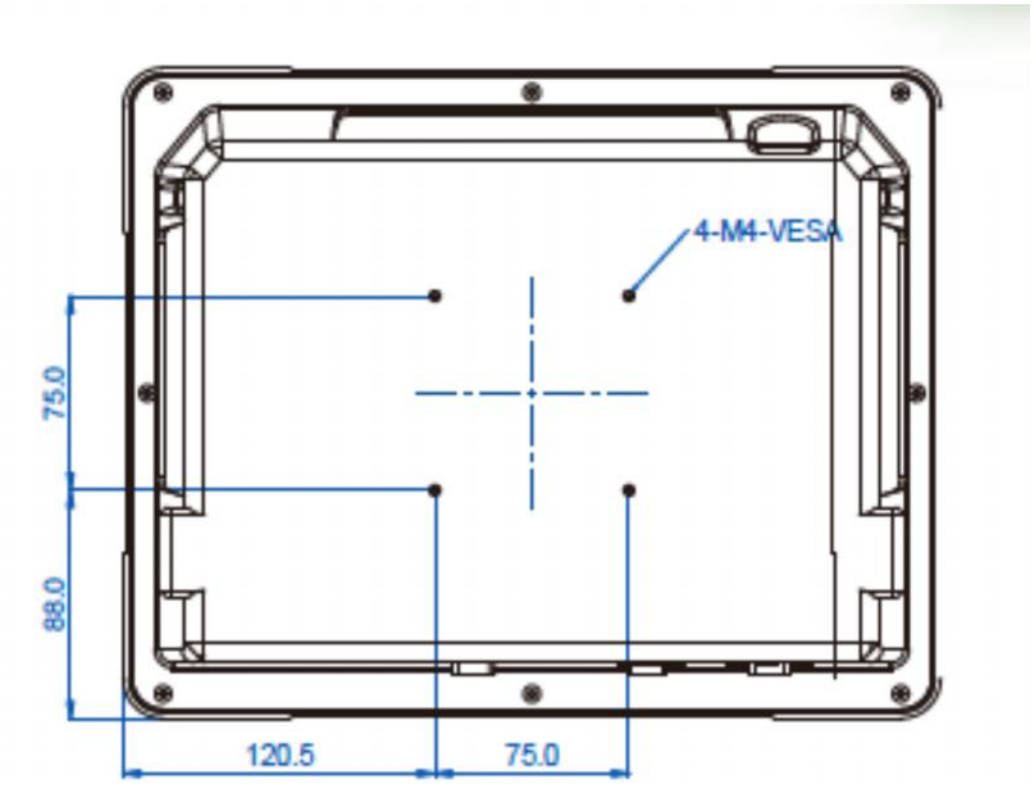

130.2
127.8
59.7


100
102
Ø4.3
72.86
50
55
50
75
75
100
102
129.6
129.6

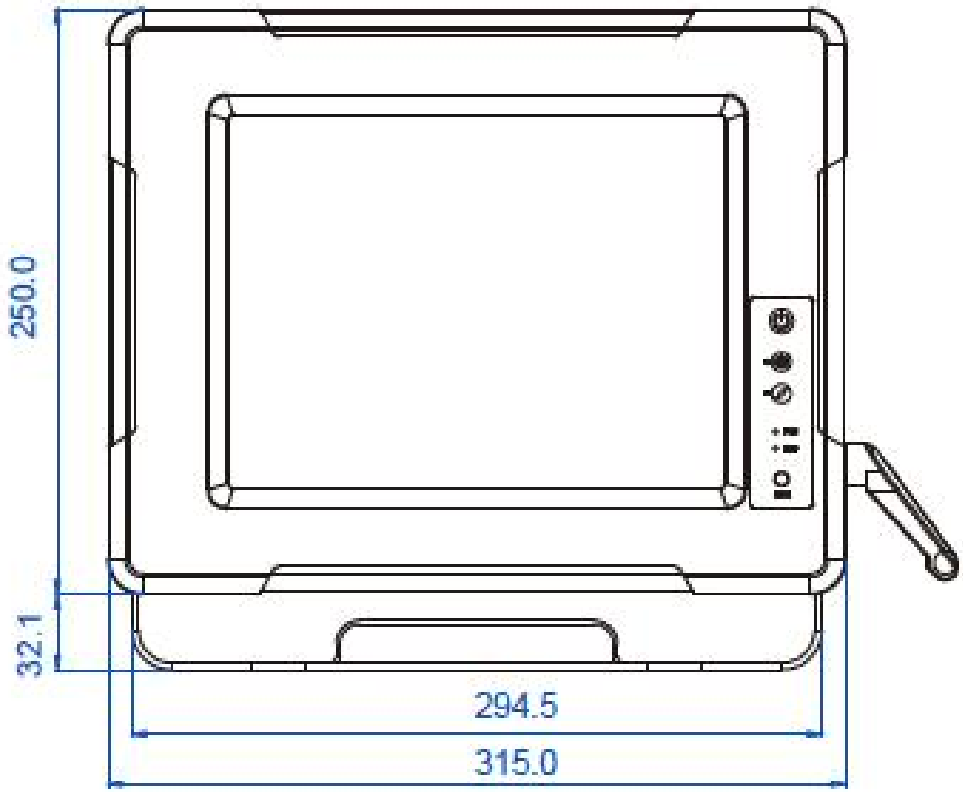
5.2 MILVM10L100-P1-5RT Mechanical Drawings

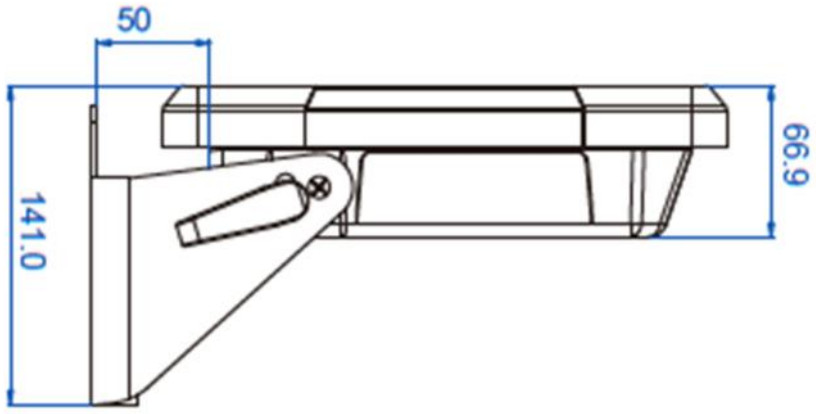


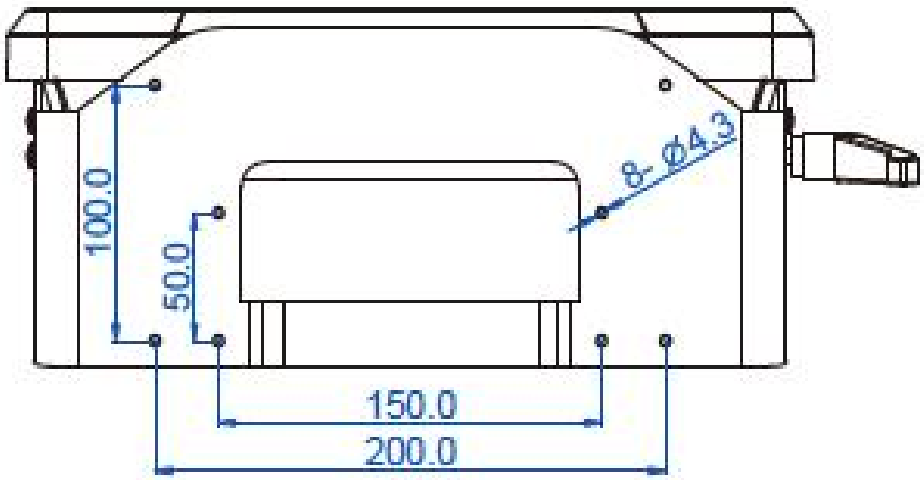



4-M4-VESA
75.0
88.0
120.5
75.0

5.2.1 MILVM10L100-P1-5RT Mechanical Drawings with Mounting Bracket:



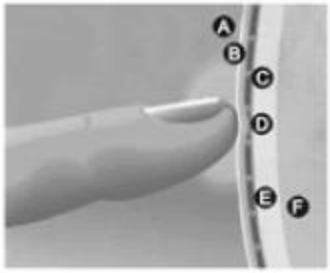



8- Ø4.3
100.0
50.0
150.0
200.0

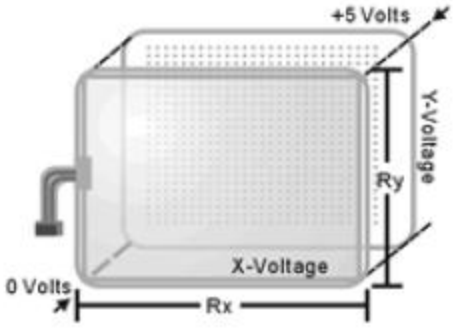
6.0 Touch Screen Solution

6.1 Introduction to Five-Wire Resistive Touch Screen

The five-wire resistive touchscreens use a glass panel with a uniform resistive coating. A thick polyester coversheet is tightly suspended over the top of the glass, separated by small, transparent insulating dots. The coversheet has a hard, durable coating on the outer side and a conductive coating on the inner side.



A Durable hard coat
B Cover sheet
C Separator dot
D Resistive coating
E Glass panel
F CRT



When the screen is touched, the conductive coating makes electrical contact with the coating on the glass. The voltages produced are the analog representation of the position touched. The controller digitizes these voltages and transmits them to the computer for processing. The five-wire technology utilizes the bottom substrate for both X and Y-axis measurements. The flexible coversheet acts only as a voltage-measuring probe. This means the touchscreen will continue working properly even with non-uniformity in the cover sheet's conductive coating. The result is an accurate, durable and reliable touchscreen that offers drift free operation. The touchscreens are sealed against contamination and moisture. The coversheet is sealed to the glass substrate with an industrial grade caulk. This prevents wicking of fluid between the coversheet and glass. Also, the touchscreens are not air vented, thereby preventing fluid ingress through an air vent.

Brief Specifications:

Subject	Details
Input Method	Finger, gloved hand, or stylus activation
Positional Accuracy	Standard deviation error is less than 0.080 (2 mm)
Resolution	Touchpoint density is based on controller resolution of 4096 x 4096
Touch Activation Force	Typically less than 4 ounces (113 grams)
Light Transmission	HL products: 80% +/–5% at 550 nm wavelength Enhanced products: 60% +/–5% at 550 nm wavelength

Update touchscreen driver or new information. Go to www.elotouch.com

7.0 Installing the Military Grade Display

7.1 Military Grade $12V_{DC}$

1. Switch off the power on both your monitor and your computer. The power switch is located in the front side of the monitor
2. Connect one end of the military grade power connector to the monitor, and the other end to the power source.

7.2 Signal Cable

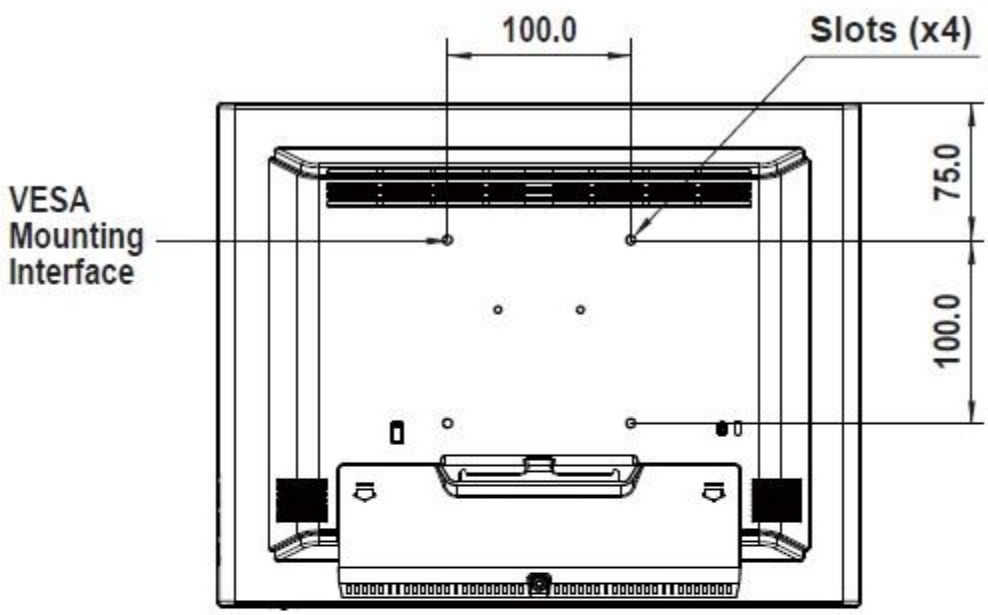
7.2.1 VGA Signal Shielding Cable Connection

1. Plug one end of the 15-pin signal cable to the video signal connector at the rear end of the PC system and the other end of the cable to your military display.
2. Secure the connectors with the screws on the cable connector at both ends.

7.3 VESA Wall Mount Installation

This monitor conforms to the VESA Flat Panel Mounting Physical Mounting Interface standard which defines a physical mounting interface for flat panel monitors. It also corresponds with the standards of flat panel monitor mounting devices, such as walls and table arms. The VESA mounting interface is located on the back of your monitor.

To mount the monitor on an UL-listed certified swing arm or other mounting fixture, follow the instructions included with the mounting fixture to be used.



⚠ ***Warning!***

Please select the proper screws!

The distance between the back cover surface and the bottom of the screw hole is 11 mm. Please use four M4 screws diameter with proper length to mount your monitor.

Please note: the mounting stand must be able to support at least 11 lbs (5Kg).

8.0 LCD Display Operation

8.1 Navigating the OSD Menu

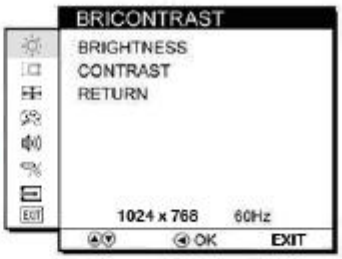
1. To display the main menu
    a. Press the MENU button
2. To select the category that you want to adjust
    a. Press the +/- button to shift up or down until the selected item is desired. Then press the MENU button again to enter the menu for that selected item.
3. To adjust the setting for a particular item
    a. Press the +/- button to adjust the value of that setting. Once you adjust the value to the desired setting, it will be stored automatically.
    b. To exit the OSD menu
        i. Select the EXIT OSD menu item, or press the EXIT key. If there is no response, or an exit command, wait for 30 second and the OSD menu is programmed to exit automatically.

8.2 OSD Menu on VGA Mode

BRICONTRAST

Press "+" to increase or "-" to decrease the brightness or contrast.

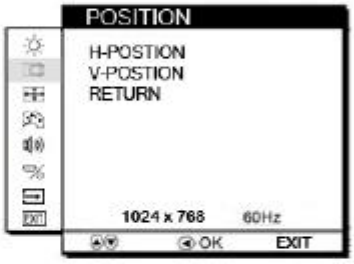
- BRIGHTNESS: Use to adjust the screen's brightness
- CONTRAST: Use to adjust the screen's contrast



POSITION

You can adjust the screen's position by horizontal and vertical manually.

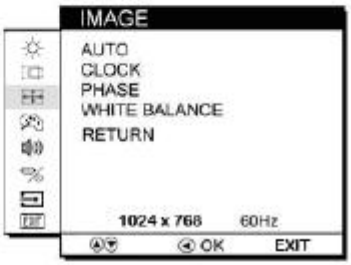
- H-POSITION: Use to adjust the image to the left or right on the screen
- V-POSITION: Use to adjust the image up or down on the screen



IMAGE

You can adjust the value of screen quality automatically.

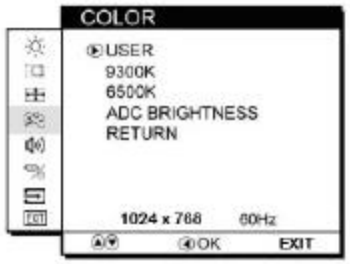
- AUTO: Use to choose the best settings for the current input signal
- CLOCK: Use to adjust the value of horizontal image
- PHASE: Use to adjust the phase control (Phase adjustment may be required to optimize the display quality)
- WHITE BALANCE: Use to set RGB signal voltage level

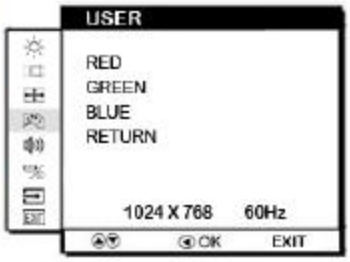


COLOR

You can select the screen's color level of the white color field from the default color temperature settings. Also, you can fine tune the color temperature by USER option if necessary.

- USER: Choose RED/GREEN/BLUE to set value of color temperature brightness to suit you own preference
- 9300K: Use to set value of monitor for the CIE coordinate 9300 color temperature
- 6500K: Use to set value of monitor for the CIE coordinate 6500 color temperature
- ADC Brightness: Set value of monitor for ADC Brightness

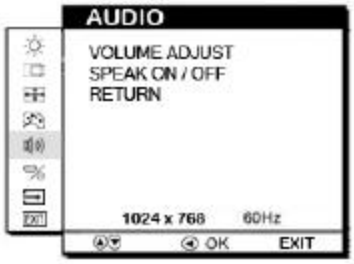




AUDIO(optional)

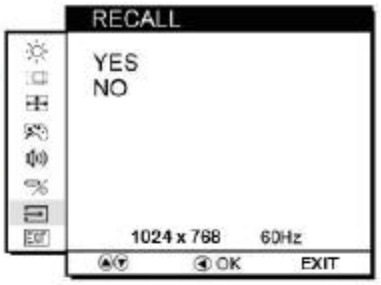
You can adjust the setting of speaker, including volume and mute.

- VOLUME ADJUST: Use to adjust the volume of speaker
- SPEAK ON/OFF: Use to make the speaker work or mute



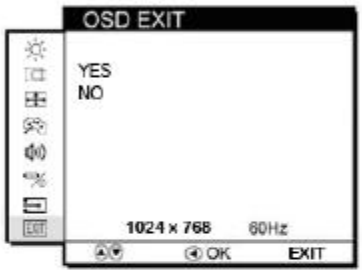
RECALL

You can recall the factory default setting by selecting "YES". Select "NO" to return the main menu.



EXIT OSD EXIT

You can exit the OSD menu by selecting "YES". Select "NO" to return the main menu.



Summary

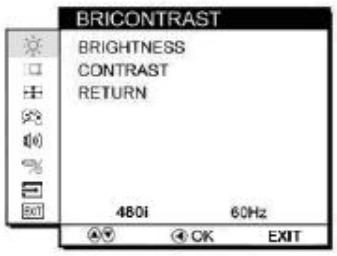
	BRICONTRAST	BRIGHTNESS CONTRAST		AUDIO	VOLUME ADJUST SPEAK ON/OFF
	POSITION	H-POSITION V-POSITION		CHANNEL	VGA DVI BNCs
	IMAGE	AUTO CLOCK PHASE WHITE BALANCE		RECALL	YES NO
	COLOR	USER (RED/GREEN/BLUE) 9300K 6500K ADC BRIGHTNESS	EXIT	OSD EXIT	YES NO

8.3 OSD Menu on DVI Mode

BRICONTRAST

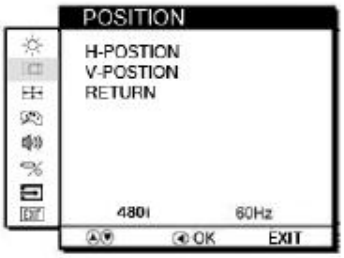
Press "+" to increase or "-" to decrease the brightness or contrast.

- BRIGHTNESS: Use to adjust the screen's brightness
- CONTRAST: Use to adjust the screen's contrast



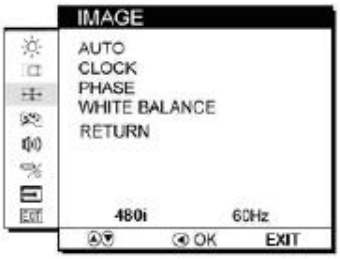
POSITION

These functions are not available under DVI mode.



IMAGE

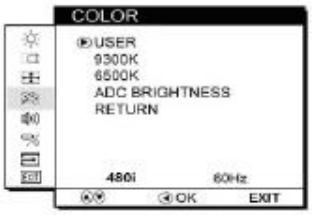
These functions are not available under DVI mode.



COLOR

You can fine tune the color temperature by USER option if necessary.

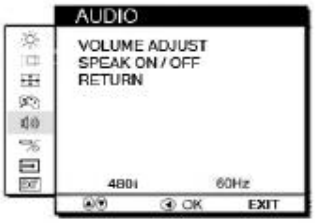
- USER: Choose RED/GREEN/BLUE to set value of color temperature brightness to suit you own preference
- For 9300K, 6500K, and ADC BRIGHTNESS, these functions are not available under DVI mode.



AUDIO(optional)

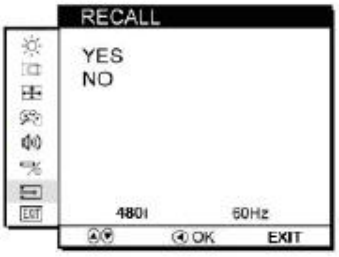
You can adjust the setting of speaker, including volume and mute.

- VOLUME ADJUST: Use to adjust the volume of speaker
- SPEAK ON/OFF: Use to make the speaker work or mute



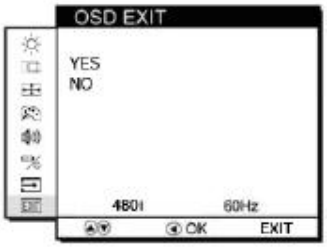
RECALL

You can recall the factory default setting by selecting "YES". Select "NO" to return the main menu.



.1 EXIT OSD EXIT

You can exit the OSD menu by selecting "YES". Select "NO" to return the main menu.



8.4 OSD Menu Summary

	BRICONTRAST	BRIGHTNESS CONTRAST		AUDIO	VOLUME ADJUST SPEAK ON/OFF
	POSITION	Not available under DVI mode		CHANNEL	VGA DVI BNCs
	IMAGE	Not available under DVI mode		RECALL	YES NO
	COLOR	USER (RED/GREEN/BLUE)	EXIT	OSD EXIT	YES NO

8.5 Simple Troubleshooting Guide

8.5.1 Brief FAQ

1. What if the display has no power after you push the power button?
    a. Make sure your power resource is working and your power cord is securely connected into the plug-in.
    b. If you have a power switch, please check to make sure the switch is in the on position.
    c. Check all sources of power to make sure that they are properly installed and connected to allow for proper electricity flow.
2. What if there are strange lines on my LCD monitor when I shut down the PC?
    a. You can use the auto-adjust function to adjust the horizontal/vertical phase and pixel frequency in order to solve this kind of problem.
3. What if my LCD monitor screen keeps blinking?
    a. Please check you're VGA or DVI connector to make sure the connector is connected well.
    b. You may also check your pins of the connector ensure that none are bent or missing.
4. Warning Signals:
    a. If you see warning messages on your LCD screen, this means that the LCD display cannot receive a clean signal from the computer graphics card. Below are three kinds of Warning Signals. Please check the cable connections or contact your local dealer or our service center for more information.
        1. No Signal
            a. This message means that the LCD display has been powered on but it cannot receive any signal from the computer graphics card. Check all the power switches, power cables, and VGA/DVI signal cables.
        2. Going to Sleep
            b. The LCD display is under the power saving mode. The LCD display will enter power saving mode when experiencing a sudden signal disconnecting problem. The monitor can be activated by pressing any keyboard, triggering the mouse or touching the screen.
        3. Out of Range
            c. This message means that the signal of the computer graphic card is not compatible with the LCD display.

8.5.2 Additional Troubleshooting Chart:

If your monitor fails to operate correctly, consult the following chart for possible solution before calling for repairs:

Condition	Check Point
1. The picture does not appear	• Check if the signal cable is firmly seated in the socket. • Check if the Power is ON at the computer • Check if the brightness control is at the appropriate position, not at the minimum.
2. The screen is not synchronized	• Check if the signal cable is firmly seated in the socket. • Check if the output level matches the input level of your computer. • Make sure the signal timings of the computer system are within the specification of the monitor. • If your computer was working with a CRT monitor, you should check the current signal timing and turn off your computer before you connect the VGA Cable to this monitor.
3. The position of the screen is not in the center	• Adjust the H-position, and V-position, or Perform the Auto adjustment.
4. The screen is too bright (too dark).	• Check if the brightness or contrast control is at the appropriate position, not at the Maximum (Minimum).
5. The screen is shaking or waving	• Press ◁ (the Auto - adjustment control) to adjust. • Moving all objects which emit a magnetic field such as motor or transformer, away from the monitor. Check if the specific voltage is applied. • Check if the signal timing of the computer system is within the specification of monitor.

For more information, please go to the website http://www.aispro.com and contact technical support to help resolve your issue. You can also e-mail support at support@aispro.com. We will be happy to help.

9.0 Appendix

9.1 Cleaning the Monitor

1. Make sure the monitor is turned off.
2. Never spray or pour any liquid directly on the screen or case.
3. Wipe the screen with a clean, soft, lint-free cloth. This removes dust and other particles.
4. The display area is highly prone to scratching. Do not use Ketone type material (ex. Acetone), Ethyl Alcohol, Toluene, Ethyl Acid or Methyl Chloride to clear the panel. It may permanently damage the panel and void the warranty.
5. If it is still not clean enough, apply a small amount of non-ammonia, non-alcohol based glass cleaner onto a clean, soft, lint-free cloth, and wipe the screen.
6. Don't use water or oil directly on the monitor. If droplets are allowed to drop on the monitor permanent staining or discoloration may occur.

9.2 Touch Screen Driver Installation

The monitor is available with USB connection. The Linux kernel 2.6.x (32 bit & 64 bit) touch driver is located on the enclosed CD-ROM. HID for Windows® 7, VISTA , XP, 2000, ME, 98.

Please Note:

The system requires 15 seconds for Windows® 7 to install/uninstall the touch drivers. Do not turn power on/off or plug/unplug the USB cable.

Driver Install Instructions:

If you are using a PC running driver Linux kernel 2.6.x (32 bit & 64 bit), follow the instructions below:

1. Power on the PC.
2. Be sure the USB cable is connected from the PC to the LCD display.
3. Open the CD-ROM.
4. Follow the step-by-step instructions as shown on the pop-up windows.

If you are using a PC running Windows® XP Embedded, follow the instructions below:

Express:

1. Power on the computer.
2. Make sure that the USB cable is connected to the computer.
3. Be sure that your EWF is disabled. If your EWF is enabled, please disable the EWF by using the EWF Manager command.
4. Once the EWF is disabled click on the XP driver on the CD-ROM and follow the step-by-step instructions as shown on the pop-up windows.

Custom:

1. Power on the computer.
2. Make sure that the USB cable is connected to the computer.
3. Follow the step-by-step instructions found in the folder file on the CD-ROM.

If you are using a PC running Windows® CE, follow the instructions below:

1. Power on the computer.
2. Make sure that the USB cable is connected to the computer.
3. Using Platform Builder, build an image file by following the step-by-step instructions found in the folder file on the CD-ROM.

If you are using a PC running Linux or Apple® Mac OS, follow the instructions below:

1. Power on the computer.
2. Make sure that the USB cable is connected to the computer.
3. Follow the step-by-step instructions found in the folder file on the CD-ROM.

9.3 RMA (Return Material Authorization) Service

Before returning any goods, please:

1. Contact American Industrial Systems, inc. Technical Support and request for an RMA number (Return Material Authorization).
2. Describe the behavior or reason of unit failure in order to return. Any returns for credit are subject to a restocking fee.
3. Upon confirmation of a hardware failure or valid cause for return, AIS will provide a Return Merchandise Authorization (RMA).
4. Make sure to receive an RMA number from AIS before returning any merchandise. Clearly write or mark this number on the outside of the package you are returning. Any returns without an authorization will be refused and returned to you by the shipper.
5. When returning goods, include the name and telephone number of a person whom we can contact for further explanations if necessary. Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question:
6. Ensure that the unit is properly packed in the original box. A product packaging manual will be included with the replacement Panel or can be emailed to you in advance. Please refer to it for the necessary instructions on how to appropriately package the panel computer being returned. Failure to do so may result in the panel shifting during transit -which may result in physical damage. Physical damage from improper packaging will void your system warranty.
7. Ship the panel back to the address provided on the RMA documentation, via an insured, pre-paid carrier.
8. Return unit must be received to address provided within 30 days, or invoice for full amount will be issued.